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COMMUNICATIONS

SOME REMARKS ON LAGRANGE'S SURGICAL TREATMENT OF DETACHMENT OF THE RETINA

BY

DR. J. A. VAN HEUVEN

UTRECHT, HOLLAND

IN the beginning of the year I ventured to put in a plea for the colmatage of Felix Lagrange as an efficacious and perfectly harmless remedy in cases of detachment of the retina. The treatment consists in making a triple row of punctures with a galvano-cautery or thermo-cautery in the sclerotic after first loosening the conjunctiva round the cornea. The conjunctiva is then replaced and fixed by means of a suture.

According to Lagrange the following consideration must be taken into account. In practically every case of detachment of the retina, tension is lowered and, taking into consideration the fact that there is an increase of intra-ocular pressure after colmatage, the already detached retina is once more pressed down against the wall of the eye; for it was an axiom with Lagrange that every case of colmatage gave rise to increased intra-ocular pressure. This, in his opinion, might be accounted for as follows:

By the formation of a cicatrix at the cauterized spot a constricting ring would be formed at the place where the fluid in the eye normally escapes. Now intra-ocular pressure did increase in the

case of several patients treated by me according to this method—and in some cases an improvement in vision and field of vision sets in.

Let me give here a short summary of the results obtained by this method. I treated 15 eyes with colmatage and for that purpose chose every case of detachment of the retina that came under my observation without selecting any particular case. The consequence was that the most divergent cases of detachment of the retina were treated with colmatage. I was convinced beforehand by experiments on rabbits that by doing so no harm would accrue and moreover, in this manner, was able to arrive at definite indications as to when colmatage might be performed, which may be stated briefly as follows:

That favourable results must not be expected from colmatage in those eyes in which detachment is of long standing, or those which are extremely myopic, or those in which the lens is absent. In the most favourable cases, eyes in which there exists a traumatic detachment of the retina, and eyes which are comparatively speaking normal, the prognosis after colmatage is better than after the usual conservative therapy. We do indeed meet with cases in which the retina shows a tendency to become re-attached even when treated according to the older method, especially after rest in bed, bandaging, injection of atropine; but as soon as the patient is discharged a relapse nearly always ensues. This is not the case after colmatage. The retina which has once become attached, remains united even after the patient has been discharged. Moreover, it is clearly shown from the series of eyes treated, which so far amount to forty-seven, that in each case the intra-ocular pressure increases after colmatage. I have never met with a single exception, either in treating human eyes, or in the case of those tests performed on animals. This increase of intra-ocular pressure has a good effect where, as is generally the case in detachment of the retina, the eye has an abnormally low tension.

In conclusion, I might add that colmatage never has an injurious effect, and is sometimes, in particularly favourable instances, certainly more beneficial than the older methods.

However auspicious these cases may be in an affection which, as regards improvement or cure, is considered so intractable, I felt in the first place the need of a somewhat firmer theoretical ground to stand on than mere hypothesis—even though it has originated in the ingenious brain of Lagrange. It was with the desire to arrive at greater theoretical certainty that I started the following experiment.

I first of all noted the effect on intra-ocular pressure in rabbits after colmatage. By performing colmatage early in the morning, it was possible to establish a continuous series of measurements of intra-ocular pressure for 15 hours in sucession. The results obtained will appear from the following tables and curves:

TABLE I.

7-8-1926. Rabbit, weight 4500 gr.
T.O.D. before and immediately after colmatage = 19mm. Hg.

after	1 hour	17	„
„	2 hours	16	„
„	3 „	16	„
„	4 „	16	„
„	5 „	17	„
„	6 „	18	„
„	7 „	20	„
„	8 „	22	„
„	9 „	23	„
„	10 „	23	„
„	11 „	23	„
„	12 „	23	„
„	13 „	23	„
„	14 „	23	„
„	15 „	23	„
„	24 „	24	„

TABLE II.

7-8-1926. Rabbit, weight 4500 gr.
T.O.S. before and immediately after colmatage = 19mm. Hg.

after	1 hour	18	„
„	2 hours	17	„
„	3 „	16	„
„	4 „	17	„
„	5 „	17	„
„	6 „	18	„
„	7 „	18	„
„	8 „	19	„
„	9 „	20	„
„	10 „	20	„
„	11 „	21	„
„	12 „	21	„
„	13 „	22	„
„	14 „	22	„
„	15 „	22	„
„	24 „	23	„

After a fall, which as a matter of fact commences directly after colmatage—indeed it already amounts to 2 mm. Hg. and lasts several hours, the pressure slowly begins to rise until it has reached its original position 6½ hours after colmatage.

This rise goes on at first rapidly and afterwards at a slower rate. A value considerably in excess of the normal is reached.

Although differences exist between these values and those found in the right eye of the same rabbit, the remarkable coincidence will at once strike one; to make assurance doubly sure a third test was made.

TABLE III.

9-8-1926. Rabbit, weight 3900 gr.
T.O.D. before and immediately after colmatage = 22mm. Hg.

after	1 hour	21	„
„	2 hours	19	„
„	3 „	18	„
„	4 „	19	„
„	5 „	19	„
„	6 „	20	„
„	7 „	20	„
„	8 „	21	„
„	9 „	22	„
„	10 „	23	„
„	11 „	24	„
„	12 „	25	„
„	13 „	26	„
„	14 „	26	„
„	15 „	26½	„
„	24 „	29	„

Here again one is struck by the fact that, though there are generally speaking, comparatively slight variations, the intra-ocular pressure, 24 hours after colmatage, is practically uniform with those obtained by previous tests as is shown in the curve (Fig. 1).

What then will be the course of intra-ocular pressure during the next few days? To a certain extent this may be gathered from the curve in Fig. 2, which gives the course of intra-ocular pressure in the case of four human eyes during the first six months after colmatage.

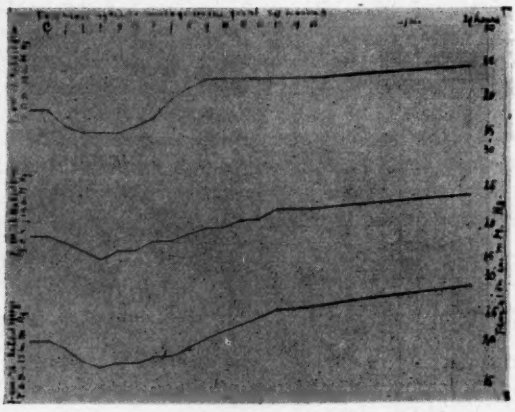

FIG. 1.

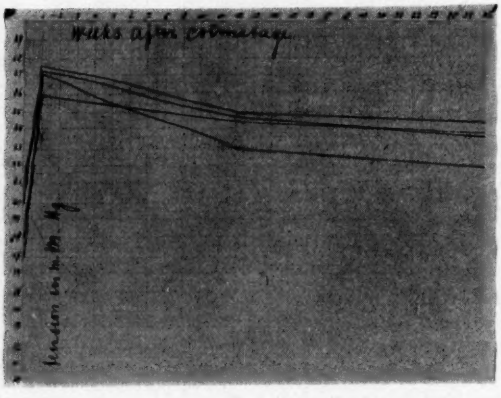

FIG. 2.

The course of the curve which registers the intra-ocular pressure is very nearly the same and consistently uniform. After a rapid rise during the first week there is a fall, which is at first more rapid than afterwards, and which subsides very rapidly. There is after six months have elapsed a higher degree of intra-ocular pressure than before colmatage.

A summary of the foregoing results leads me to infer that colmatage is followed by changes of intra-ocular pressure. After a comparatively slight fall which lasts a few hours, there is a considerable rise, which, it is true, decreases, but so gradually that the pressure is higher after six months have elapsed than before colmatage.

Another problem which has engaged my attention is an estimation of the percentage of albumen in the fluid of the anterior chamber. There exists a fairly extensive literature on the subject and there are various methods of determining it. Generally speaking, one gathers from the literature that with a concentration of albumen of 0.1 per thousand, the method most to be recommended is to ascertain the superficial tension. Dieter indicates a way of ascertaining this. In cases of concentration of albumen from one per thousand to one per cent. chemical methods should be used. Wesseley in particular attaches much importance to this method. Wesseley's method of estimating the percentage of albumen is of great value on account of its simplicity and reliability, at least, when the concentration of albumen in fluids is between one per thousand and one per cent. If the percentage of albumen is higher it is better to use a refractometer. Wesseley's method is very often wrongly applied and he calls our attention to this. The point is to compare the density of the turbidity which arises when Esbach's reagent is added to the serum. If the mixture is no longer fresh and therefore already precipitated, it should be well shaken before being used. Standardization necessary for this, is obtained by first determining the percentage of albumen in fresh serum, for instance, by precipitation and weighing or by using the refractometer. By then diluting the serum with a physiological solution of chloride of sodium we get the concentration of albumen to 1/1000 per cent.; a small quantity of which is then taken, for instance, four drops, and the same amount of Esbach's reagent added to it. Wesseley then corks and seals the tubes and keeps them in a good state of preservation for several weeks. By melting them, after first adding a trace of carbolic acid, I have succeeded in keeping them for months, and I opine they might be kept for an almost indefinite time.

I have, in this manner, endeavoured to determine the percentage of albumen in rabbits, both before and several times after colmatage. But here a difficulty presented itself, for the formation of albumen in the fluid after puncture had to be taken into consideration. We

have to reckon with the increase in the percentage of albumen. The amount is, according to Wesseley, far higher in rabbits than men.

Wesseley found that in the case of fully grown rabbits there was a percentage of albumen in the first fluid in the anterior chamber from 0.02—0.03 per cent. and 3.5—4.5 per cent. in the second.

In these tests, however, the second puncture of the fluid in the chamber was made a short time (16 to 20 hours) after the first and the percentage of albumen is not nearly so high a few weeks after the first puncture. A slight rise, however, may be attributed to the regeneration of the fluid in the chamber. This of course holds good only in the second instance but not in the first.

It was therefore of importance to measure the percentage of albumen in the fluid of the chamber in eyes that had not first been punctured. It was impossible first to determine the percentage of albumen in the same eye, afterwards to perform colmatage, and then determine the percentage of albumen again. This difficulty was overcome by selecting rabbits with normal eyes. The percentage of albumen in the fluid of the chamber was first determined in one eye and then colmatage performed on the other eye, and, at various times afterwards, the percentage of albumen in the fluid was determined; it being of course assumed that the percentage of albumen in the fluid was the same in both eyes; an assumption to which there can be very little objection.

The results were as follow:

TABLE IV.

Weight of rabbit in grammes.	Percentage of albumen in the liquid of the anterior chamber. O.D.	Percentage of albumen of the anterior chamber after colmatage, after one day. O.S.	After one week.	After one month.	After two months.
3100	<0.02	0.5	—	—	0.02
3600	>0.02	—	0.1	—	0.02
3050	<0.02	—	—	0.3	0.02
3200	>0.02	0.4	—	—	0.03
3450	0.03	—	0.2	—	0.04
3300	>0.02	—	—	0.4	0.04
3550	0.03	0.4	—	—	0.03
3250	0.03	—	0.3	—	0.02
3350	>0.03	—	—	0.3	0.02
On an average	>0.02	0.4	0.2	<0.04	>0.02

It is therefore a fact that the percentage of albumen in the fluid of the chamber increases after colmatage as is shown in Fig. 3.

The question is, can this, wholly or in part, explain the increased intra-ocular pressure?

The most recent views on the subject may be epitomized as follow:—We may, basing our assumptions on the above-mentioned data, regard intra-ocular pressure as the intra-ocular blood pressure in the capillaries which is directed to the fluid in the chamber diminished by the colloid plus crystalloid pressure in the blood, which is directed against it. In the same manner—to the fluid in the

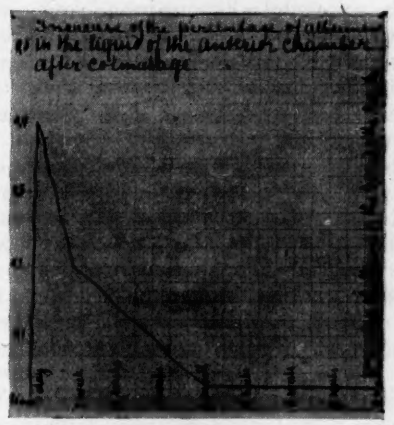

FIG. 3.

chamber—the crystalloid and colloid osmotic pressure of the fluid in the chamber is directed. If therefore the colloid osmotic pressure increases—and this is the crux of the matter—there will also be an increase of intra-ocular pressure. So we see that the increase of the percentage of albumen in the fluid of the chamber is without doubt one of the causes of the rise in intra-ocular pressure after colmatage. It appears however, from the course of the curve, that there is considerable incongruity between the two. This proves that the increase of intra-ocular pressure is certainly not due to the percentage of albumen alone.

Another question that arises is, can the width of the blood-vessels be an explanation of increased intra-ocular pressure after colmatage?—or to put it more accurately—what *rôle* does the width of the blood-vessels play in the case?

In order to enable us to form an opinion the following facts must be taken into consideration. Ocular pressure is determined by the

blood pressure in the capillaries and influenced by osmotic changes. Now it is evident that no direct relation exists between blood-pressure and the pressure in the capillaries. This is obvious from the intra-ocular capillary pressure as found in normal eyes. There is but slight variability in capillary pressure, whereas the blood pressure varies considerably. For metabolism the most important part is the capillary region. Everything is adapted so as to ensure the most favourable conditions as regards pressure and circulation. The pre-capillary arterioles play an important part as regulative agents. Arterial pressure is determined by the aggregate amount of the peripheral resistances and whenever arterial pressure is high (nephritis) a steady pressure is kept up in the capillaries automatically.

By his investigations Wesseley has proved that by using adrenaline, which causes the blood-vessels to contract, intra-ocular pressure decreases with increase of blood pressure. Adrenaline makes the capillaries contract. But the mass of the contractile elements is slight, compared with the arteries and arterioles, with the consequence that while pressure increases up-stream it decreases down-stream. So pressure diminishes in the capillaries and this causes a fall in intra-ocular pressure. In contrast to this, amyl nitrite causes great general dilatation of the blood-vessels and decrease of blood pressure which brings about increased intra-ocular pressure.

To epitomize all that has been published about *the width of the blood-vessels* in connection with intra-ocular pressure would be going too much into detail. To put it briefly, the action of specifics is vascular. One theory is certain, *viz.*, that the width of the blood-vessels has an influence on intra-ocular pressure. The *hyperaemia*, which sets in after colmatage, and usually lasts from 10 to 20 days, may in itself be regarded as a factor which tends to increase the pressure. If, however, a stimulus excites a tissue, it first reacts by producing an anaemia of short duration by contraction of the vessels, followed by hyperaemia, and, if the stimulus has been exceptionally strong, by symptoms of inflammation. In this way it may be possible to find a cause for the initial decrease of ocular pressure after colmatage and to regard it as a reflex cramp of the vessels. The exposure of the sclera is in itself a factor which might tend to diminish pressure.

The fact has already been established, that increase in the percentage of albumen in the fluid of the chamber and vascular dilatation are important factors in the explanation of the increased ocular pressure after colmatage. Both these factors are due to the stimulus which is applied to the wall of the eyeball round the cornea. They are both factors, which might be brought about by stimulating the same place in a different manner, until these inflammatory symptoms appeared; in other words, there is no specific "colmatage-action."

On one of the first occasions that he saw colmatage performed, Professor Snellen made the following remark: "I wonder whether the loosening of the conjunctiva does not also give rise to increase of pressure." And a light is thrown on this remark by the following account. For if the pressure-increasing action of colmatage is due to symptoms of inflammation as shown by the increase in the percentage of albumen and in the width of the vessels the simple fact of the loosening of the conjunctiva must have a similar though less pronounced effect. The right eye of a rabbit of 3100 gr. had a tension of 20 mm. Hg.; after the conjunctiva had been loosened the pressure remained 20 mm. Hg. Here pressure increased very little, but may have risen temporarily. The left eye of the same rabbit had a percentage of albumen in the fluid of the chamber of 0.03 per cent. There was in the fluid of the chamber of the right eye a percentage of albumen of 0.05 after ten hours. Here there is an appreciable rise. Both these figures show that in principle Snellen was right. In short my contention is, that Lagrange's opinion, that increase of pressure after colmatage is caused by a constricting ring formed by cicatrization, has never been definitely proved.

Most decidedly it is not the only cause of increase in pressure. Certainly colmatage does bring about an increase of intra-ocular pressure. There is a considerable increase in the percentage of albumen in the anterior chamber of the eye. And the question arises; does not this increase, which is considerable even in rabbits with normal eyes, become more pronounced in eyes in which there is a detachment of the retina?

The views entertained at present about hydrodynamic and osmotic forces in their relation to intra-ocular pressure, make it reasonable to suppose that the rise of colloid osmotic pressure in the fluid of the chamber will be followed by an increase of intra-ocular pressure. Here we have at any rate one factor that certainly plays an important part. Then what we know about the width of the vessels in the eye in connection with intra-ocular pressure also fits into our scheme. It is not impossible that the constricting ring of Lagrange may play a more or less important *rôle* in some cases. In any case the discharge will be impeded on account of the increase of viscosity of the fluid in the chamber. These are all factors which make for increase of pressure in the eye, and there may be others with which we are at present unacquainted.

Tension increases; now the question is, does the fact of the increase of intra-ocular pressure also imply that the retina is pressed against the wall of the eye. An answer in the affirmative is not possible until the matter has been more thoroughly investigated.

The condition which exists in detachment of the retina may be conceived of thus: in a space filled with liquid, the eyeball, a membrane partially detached is suspended—in other words—the

membrane is surrounded on both sides by liquid. Pressure exercised on one part of this liquid mass does not force the retina against the wall—the fluid at the back preventing any such pressure being effective. A part may perhaps be forced out through the lymph paths, but owing to the great increase in the percentage of albumen in a part of the retina, there will undoubtedly be osmotic action in which the retina acts as a semipermeable membrane.

This explains why fluid enters in front of the retina and is discharged at the back.

I consider the effect of colmatage is partly due to this, and that it plays an important *rôle* in these cases in which the retina adheres after colmatage.

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THE HISTORY OF OPHTHALMOLOGY IN EGYPT

BY

A. F. MACCALLAN, C.B.E.

LONDON

AN important communication on the history of ophthalmology in Egypt was made by Dr. Meyerhof at the Annual Congress of the Ophthalmological Society of Egypt in this year. It deals mainly with the Nineteenth Century, but his preface contains some items of great interest concerning earlier times. The excavation work of Dr. Reisner near the Pyramids of Giza is well known to Egyptologists, and his recent discovery should be known to ophthalmologists. He has found the funeral stele belonging to the earliest known oculist of human history, whose name is PEPI-ANKH or IRI. He practised both as an oculist and a magician at the court of one of the kings of the Sixth Dynasty, about 2500 B.C. This interesting document will shortly be published by Professor Junker of Vienna in the *Aegyptische Zeitschrift*.

The development of ophthalmology as shown in early Arabic literature has been studied also by Meyerhof, and an article on the subject appeared in the February number of this journal.

The first famous medical traveller in Egypt was the Venetian, Prospero Alpino, who sojourned in Cairo from 1580 to 1584. He published in Venice a book which saw many editions, the last

being that of 1829. Prosper Alpinus, as he is usually called, gave the first exact records of the prevalence of ophthalmia in Egypt and of its increase during the hot season.

In 1598, Baron Harant of Poljitz, a Bohemian gentleman, visited Cairo and wrote a most original and intelligent description of his journey, a German translation of which appeared at Nuremberg in 1678. He was the first to describe the masses of flies on the eyes of the children, and to express the opinion that the flies were the cause of the ophthalmia, "as they soil, eat and infect them." The travels in Egypt of Tourtechot de Granger were described in a book published in Paris in 1745, wherein Egypt for the first time is called the "Land of the Blind."

That fascinating book "Travels to Discover the Source of the Nile," by James Bruce contains some details of interest to ophthalmologists. The seven volumes of the edition published in Edinburgh in 1813, containing the book-plate of Sir Auckland Colvin, were presented to the present writer as a token of friendship by Meyerhof, some years ago, or he would no doubt have given extracts. Bruce was a Scottish gentleman, who came to London when a young man, and married the daughter of a prosperous wine merchant; after her death he travelled much on the Continent, and, with a view to voyages of discovery in Abyssinia, became British Consul at Algiers. In 1769, he went up the Nile to Kus in Upper Egypt; from thence across the desert to Kosseir on the Red Sea. From thence he proceeded by sea to Massowah, and penetrated to the interior of Abyssinia where he lived for several years, refusing important administrative positions, but placed in military commands occasionally during fighting. He returned *via* the Soudan, reaching Cairo in 1773. During a visit to Assouan, the Syene of Pliny, on his outward journey, he writes "though Syene by its situation should be healthy, the general complaint is a weakness and soreness in the eyes; you scarcely ever see a person in the street that sees with both." This observation was made in January, during the cool season when the average mid-day temperature is 23.7 degrees C.; the various micro-organisms which cause acute conjunctivitis have then full activity. Had Bruce's visit been made in June, July, or August he would have seen the same number of blind people perhaps, but very few with acute ophthalmia, as with a mid-day temperature of over 41 degrees, the micro-organisms causative of the inflammation become dormant, or at any rate their activity is restrained.

The Nineteenth Century

It is a well-known fact that Egyptian or Military Ophthalmia, as it was then called, attacked nearly all the European armies during the Napoleonic wars. It was a mixture of trachoma,

blennorrhoea, and more harmless forms of conjunctivitis, probably mostly due to infections by the Koch-Weeks bacillus. It lasted until about 1850, and its history has been told again and again by physicians and surgeons. The Italian and German oculists shared the British opinion as to its contagious character, which was constantly denied by the French, and by several of the Belgian and Russian observers.

The Napoleonic campaign in Egypt has an important ophthalmic literature, much of which is referred to by Boldt (translation by Parsons and Snowball, London, 1904). The chief authority, as is well known is Larrey, but Meyerhof with the enthusiasm of a real bibliophile gives a number of others. Some of these seem to be sufficiently interesting to enumerate here: McGrigor, "Medical Sketches of the Expedition to Egypt from India," London, 1804; George Power, "Attempt to Investigate the Cause of the Egyptian Ophthalmia," London, 1803; Brigges in Trotter's "Medicina Nautica," London, 1804; Arthur Edmondston, "A Treatise on the Varieties and Consequences of Ophthalmia, with a Preliminary Inquiry into its Contagious Nature," Edinburgh and London, 1806; Douglas Whyte, "Mode of Managing Ocular Inflammation," *Med. and Phys. Journal*, 1802; Wittmann, "Travels in Turkey and Across the Desert into Egypt," London, 1803; Louis Frank, "De l'Ophtalmie d'Egypte," Paris, 1812; Deruez, "Essai sur l'Ophtalmie d'Egypte," Strasburg, 1804; Desgenettes, "Histoire medicale de l'Armée de l'Orient," Paris, 1802; Bruant, "Notice sur l'Ophtalmie regnante," Paris, 1800; Savaresi, "Descrizione dell'Oftalmia d'Egitto," Cairo, 1800.

From 1800 to 1825

The French scholars who accompanied the Emperor Napoleon to Egypt found no trace of scientific medicine remaining: the old Arabic traditions were lost. The only hospital in Cairo, and probably in the whole of Egypt, was that founded at the end of the Thirteenth Century by the Mameluke Sultan Qalawun. It had degenerated to a dirty prison by 1800, where a few insane patients were kept in chains and treated with the whip. Immediately after the evacuation of Egypt by the French, their important sanitary institutions were destroyed or disorganized, in particular their ophthalmic hospital at Giza.

In 1805, Mohammed Ali, an Albanian adventurer, was nominated Pasha of Egypt, from whom the present sovereign is descended. Very soon the extraordinary gifts of this energetic and broad-minded ruler became evident. He began to create avenues, squares, and sanitary establishments. He set a brilliant example of progressiveness by submitting one of his daughters to Jenner's

new method of preventing small-pox, thereby attacking one of the principal causes of blindness.

From 1826 to 1850

When Mohammed Ali Pasha had firmly established his rule the urgent needs of his army compelled him to organize a sanitary service. In 1825, he nominated Antoine Clot, a young French physician, as chief surgeon of the Egyptian Army, who will for ever be known as the illustrious Clot Bey. Clot Bey constructed a large military hospital and medical school at the depot of the army where 25,000 men were gathered together. The lectures of the European teachers had to be translated to the classes by interpreters. Then two learned brothers named el-Rashidi were sent to France for medical and linguistic education, who on their return translated and printed in Arabic some of the more important textbooks, including Sichel's textbook on ophthalmology. The difficulties arising from religious prejudice a hundred years ago may be imagined, and once Clot Bey's life was attempted in the anatomical theatre while performing an autopsy. Moreover envy and animosity among Europeans, and intrigues at the Pasha's court created many obstacles to Clot Bey's scheme of organization. In 1837, the military hospital was transferred to new buildings at Qasr-el-Ainy in Cairo, where there was accommodation for 1,500 sick soldiers and 300 medical students. Clot Bey and his assistant and successor Pruner, a capable German, left short writings on eye diseases in Egypt and on their treatment. Each rejected the theory of contagion in the case of both ophthalmia and plague. Clot Bey during his twenty-five years sojourn in Egypt suffered seventeen attacks of ophthalmia, to which he attributes the loss of vision in one eye, though this was more probably the result of detachment of the retina. During the wars of Mohammed Ali Pasha, Clot Bey saw thousands of Greek prisoners suffering from ophthalmia immediately after their transport to Egypt: the same was the case among the Syrian recruits sent to Egypt after 1832; in 1836, more than 20,000 of them were treated for ophthalmia with good results. To Clot Bey belongs the great credit of introducing nitrate of silver and sulphate of zinc into the therapy of acute eye diseases.

From 1850 to 1880

After the death of Mohammed Ali Pasha and the short reign of his step-son Ibrahim Pasha, there followed under Abbas Pasha (1848-54) a certain reaction against French influence, during which Clot Bey was temporarily replaced by his German assistant Pruner Bey. The latter sent several medical student missions to Europe,

one of which visited Gratz in Styria. Here the oculist Pieringer was working, who succeeded, aided perhaps by information obtained from the Egyptian students, in proving the identity of urethral and ocular gonorrhoea, and in separating clinically the blennorrhoea of the human eye from the other forms of acute conjunctivitis (Pieringer, "Die Blennorrhoe am Menschenauge," Gratz, 1841). The distinguished Greek ophthalmologist Anagnostakis visited Egypt in 1851 and found the teaching of ophthalmology at Qasr-el-Ainy in the hands of a young native oculist who had received part of his medical education in Paris. However he had little success as the preliminary education of the medical students had been unsatisfactory, all the primary and secondary schools founded by Mohammed Ali Pasha having ceased to exist (Anagnostakis, "De l'Ophtalmologie en Grece et en Egypte," Compte-rendu du Congrès d'Ophtalmologie de Bruxelles, 1857; Paris, 1858). Anagnostakis should be remembered in trachomatous countries for having devised a satisfactory operation to correct entropion, at a time when either useless or devastating operations were in vogue. In 1856, in the reign of Said Pasha the Qasr-el-Ainy hospital and school of medicine were reorganized by the minister Edhem, competent European teachers being obtained. About this time there was a certain amount of ophthalmic treatment carried out by general surgeons, but the study of ophthalmology was neglected.

A new era began in 1869, when Dr. Tachau, a pupil of Albrecht von Graefe settled in Cairo and later in Alexandria. He was the first to introduce the modern operations for cataract and glaucoma, also plastic operations on the eyelids to relieve the sequelae of trachoma. After Tachau, Dr. Brugsch Bey settled in Cairo and had an enormous practice from 1878 until his death in 1894, after he had been nearly blinded by membranous conjunctivitis.

From 1880 to 1900

Egypt may be proud of the fact that the bacteriological era was partly inaugurated on her soil. Robert Koch in 1883 came to Alexandria to study the epidemic of cholera then raging. Besides discovering the comma bacillus, he examined the discharge from the eyes of persons suffering from ophthalmia in the summer, finding the gonococcus (discovered by Neisser in the urethral discharge in 1879), and in the slighter cases the thin rod-shaped bacillus (rediscovered five years later by John Weeks in New York), known as the Koch-Weeks bacillus. Kartulis, a distinguished Greek surgeon interested in bacteriology working at Alexandria, thought the Koch-Weeks bacillus was the cause of trachoma.

Decisive progress in the bacteriological investigation of ocular infections in Egypt was made when Morax of Paris, in 1901, working at Alexandria, showed us how to distinguish the acute affections of the conjunctiva one from another, and from the chronic disease trachoma. He discovered the bacillus which is known as the Morax-Axenfeld bacillus (Morax, "Recherches cliniques et bactériologiques sur la conjunctivite granuleuse," Paris, 1902. Separate reprint from the *Annales d'Oculistique*). The work of Morax was continued by Lakah and Khouri (*Annales d'Oculistique*, 1902).

In 1889, Julius Hirschberg made a winter stay in Egypt and later published at Leipzig in 1890 an exhaustive historical and clinical study of trachoma. Ernst Fuchs visited Egypt at the end of the nineteenth century, as he has done many times since, and published sketches of what he had seen on the Nile.

There have been several Egyptian oculists of distinction, whose names are household words in Egypt, though long since dead. Eloui Pasha the chief of these received his medical education in France, and became Professor of Ophthalmology at the Government Medical School in Cairo. He read an interesting paper on trachoma at the International Congress of Medicine held in Cairo in 1902. It is interesting to remember that he ceased to be a member of the Ophthalmological Society of Egypt in 1911, as objection was raised by members to widespread advertisements issued by a drug store in which he had a financial interest, of "Dr. Eloui Pasha's Eye Drops." Other specialists were Saad Bey Sameh, Owf Pasha, and Ali Bey Haidar. Among the many foreigners practising in Egypt first must be noted Max Meyerhof to whose erudition the material of this article is due; Alfred Osborne, a pupil of the Archduke Karl Theodor, whose suggestion of utilizing the Cassel ophthalmic benefaction for the provision of travelling ophthalmic hospitals, was accepted; Peretz, a pupil of Truc of Montpellier; Demetriades and Jacovides, both of whom still practise at Alexandria.

Shortly after the British occupation of Egypt in 1882 Kenneth Scott, and later Fischer, occupied the post of chief ophthalmic surgeon at Qasr-el-Ainy; under them a very adequate teaching organization was developed. One of their assistants was a very dexterous Egyptian surgeon, Bayoumi Bey, from whom the present writer obtained much practical help.

From 1900 to the present day

Dr. Alfred Osborne of Alexandria, who has been mentioned above, at the same Annual Congress of the Ophthalmological Society of Egypt, made a communication on the ophthalmic history of Egypt from 1900 to the present day. The important

clinical, pathological, and historical work carried on for many years by Osborne, Meyerhof, and Peretz should always be remembered, when stress is laid on the more spectacular work carried out by the present ophthalmic organization of the Egyptian Government. This originated in the financial provision of two travelling ophthalmic hospitals by Sir Ernest Cassel. Their success under careful professional and political management has allowed the development of the numerous specially designed and built ophthalmic hospitals in the larger towns, while travelling hospitals tour the more remote districts. There is a special teaching hospital in the environs of Cairo, and adjoining it a special ophthalmic laboratory, which is a separate and monumental building, and is probably the best ophthalmic laboratory in the world. At the present time a British ophthalmologist and a British pathologist receive from British sources adequate remuneration for teaching and research work, and it is expected that their labours will throw further light on the causative factor of trachoma. The staff of the Ophthalmic Hospitals (which form a section of the Department of Public Health) consists of Egyptian surgeons, two for each hospital, who received their post-graduate ophthalmic training from the former British Director of the Egyptian Ophthalmic Hospitals, between 1903 and 1924. The annual cost of the Ophthalmic Department to the Egyptian Government is now about £60,000 a year. A prosperous and scientific school of ophthalmologists has therefore arisen in Egypt so long called the "Land of the Blind." The Ophthalmological Society now has 100 members, and publishes an annual bulletin containing an account of its activities, copies of which may be obtained from the honorary secretary of the Society (c/o the Department of Public Health, Cairo). The reports of the British Director of Ophthalmic Hospitals have been printed and published from 1912 to 1922 by the Government Printing Press, Cairo, containing accounts of clinical and pathological research.

Since arrangements for ophthalmic treatment have been provided in most of the large towns and even in the remote country districts, it will naturally be asked if there has resulted any appreciable diminution of blindness. This may be answered by Professor Fuchs, certainly one of the best ophthalmic observers now living, who wrote in 1924: "The result of these campaigns against diseases of the eye is best noted by the decrease in the number of blind persons. When I visited Egypt for the first time some 30 years ago it was a common sight in the larger towns to see four or more blind persons being led about through the streets by a half-blind man."

The Fourth International Congress for the Amelioration of the lot of the Blind was held in Cairo in 1911, when proposals were

made for the establishment of a vast educational establishment for the blind (*vide* the *Ophthalmoscope* for December, 1911). Such a scheme would have diverted Government funds from the then barely established organization for the treatment of eye diseases and required some trouble to defeat. The lot of the blind in Egypt is not so hard as in other countries, and as Dr. Osborne points out it is difficult to get inmates for the existing blind schools at Cairo and Alexandria.

A systematic and regular ophthalmic inspection of the schools is now carried out by the ophthalmic staff of the Department of Public Health, which is combined with an efficient organization for treatment of those with active trachoma or other forms of conjunctivitis, in the schools themselves.

Dr. Osborne concludes his paper by saying: "Egypt may well be proud of what has been achieved."

SOME NOTES ON SARCOMA OF THE UVEAL TRACT

BY

R. C. DAVENPORT

MOORFIELDS RESEARCH SCHOLAR

LONDON

IN Vol. XIII, p. 104, of the Ophthalmic Hospital Reports, Lawford and Collins published a paper giving details of a series of 103 cases of sarcoma of the uveal tract treated at Moorfields from 1871-1890. Marshall followed this in Vol. XV, p. 51, with a series of 58 similar cases from 1891-1898. The present paper records a similar series of 35 cases, at Moorfields in 5 years, October, 1918-October, 1923.

Frequency.—The first point of interest is the consistent yearly incidence at Moorfields. Over the whole period, 1871-1925, 55 years, there are recorded 345 cases where an excised eye was found to contain a sarcoma of the uveal tract. This gives an average of just over 6 per year. In the 28 years previously recorded there were 161 cases, *viz.*, just under 6 per year, and in my collected cases the average is exactly 7.

In the other series a few extraneous cases were published so that the actual Moorfields figure then was slightly under 6 per year. The regularity of incidence over so many years is somewhat striking, however, although the increase is less sharp than might be expected in recent years when the figures for new patients are almost double those for 1870-1890. One factor possibly bearing on this was the difficulty in pathological work and reports in the years

just around the end of the war. Through this a few cases may have remained unrecorded.

The figures usually given are 3-6 cases per 10,000, but by the numbers at Moorfields it works out at more like 2 per 10,000 or even under that now, when the increase in refraction work is apparent.

It may be supposed that some cases of detachment of the retina due to an unsuspected uveal sarcoma are not subjected to operation and later go elsewhere, but such must be very few indeed.

Sex.—It is usually stated that males predominate slightly in frequency in choroidal sarcoma. In the total number of 345 cases recorded at Moorfields there are 175 female, 167 male, and three not recorded. These numbers include a few cases of iris sarcoma in which female incidence is more common. In the 35 cases in this series there are 23 females to 12 males (65.7 per cent. to 34 per cent.). Three cases (two females and one male) were of iris sarcoma, but even after exclusion of these there is a very unusual preponderance of female incidence.

Age.—Average age, Lawford's and Collins series, 48.42; Marshall's series, 54.63; recent series, 50.4 (youngest, 13; oldest, 71).

Eye affected.—The total figures do not show that there is any reason to believe one eye to be more frequently affected than the other.

Tension of the eye at operation.—In this series tension was noted as normal in 18 cases, and raised in 16. The bearing of this upon the ultimate result does not help much in view of the small number of traced cases, but it at least shows how often the condition arrives at the stage of acute glaucoma before advice is sought.

In one case the tension was noted as below normal and in this case the ciliary body was involved in the growth—the usual state of affairs when tension is low—in the other two cases where the ciliary body was noted as being definitely involved the tension was not raised in one, but raised in the other. Of the three cases where the sarcoma arose in the iris, two showed increased tension.

Nature of growth.—Various types of sarcoma were found on pathological examination, *viz.*, flat, rounded, lightly, and heavily pigmented, round-celled and spindle-celled—the latter being the more frequent. In one or two the pigment was so slight that the macroscopic appearance approached that of leuco-sarcoma, though section always showed the presence of pigmentation.

After history.—I have tried to get in touch with every case in this series, but have only succeeded in 22 cases. Letters have been returned in some cases, no reply sent in others, and outside evidence from the original doctor of the case has not helped me further.

In view of the difficulty now of tracing cases in the General Register Office, I have made no attempt to have the records there searched for any death records of the untraced cases.

Of the 22 cases traced, 10 are known to be alive and well at the following periods since excision: 3½ years (three cases); 4 years (three cases, one of iris tumour); 6 years; 6½ years (iris); 8 years (two cases). It may be hoped that several of these will remain free from recurrence, although there is no certainty, especially in the cases with a shorter period of freedom. However the figure remains that of the whole series 28.5 per cent. are known to have lived apparently free from recurrence for more than three years from the time of excision.

The remaining 12 cases (34.28 per cent. of the whole series), are known to have died, or actually 11 have died and one is so widely affected by secondary deposits that her death must be imminent.

Including this case, 7, or 20 per cent. of the whole, are known to have died of recurrence at the following periods after excision: one less than one year (abdominal tumours in hospital); three at two years, all with abdominal tumour and one also generalized; one at three and a half years, generalized recurrence; one at four years, brain tumour; one at six and a half years, generalized.

This last case is the one not yet deceased. The eye was excised in 1920, and she was well till 1924, when a subcutaneous tumour appeared in the shoulder region. Gradually further tumours have appeared beneath the skin and she now has abdominal growths and cannot be regarded as other than a hopeless case. But no recurrence showed itself for four years subsequent to excision. This case is in its history similar to the living case in the family which I have recorded under the title of "A Family History of Choroidal Sarcoma." (*Brit. Jl. of Ophthal.*, September, 1927.)

In the remaining five cases the details are as follow: One died two months after operation from heart failure. One died of heart disease and dropsy one and a half years after operation. One died of pleurisy, no evidence of recurrence, two years after operation. One died two years later, cause unknown. One died six years later (at the age of 74) of general failure, showing no signs of recurrence.

Of all the cases that died I have not obtained evidence of a single case showing recurrence in the orbit. One case alive, complains of pain in his socket three and a half years after excision, but there is no sign of a recurrent tumour there. In one case exenteration of the orbit was performed as the tumour had invaded the tissues outside the globe. He was seen and found clear three months after operation, but I have been unable to trace him since then.

Thirteen cases I have failed to get in touch with lately. From the notes some of these must be expected to have had recurrence as the lesion was either long standing or well advanced when the

patient came to hospital and excision was undertaken. Most of the cases failed to attend hospital for more than three months after excision, but two were seen alive, one well over three years after operation, and one over two years after.

Unusual features.—In no case do the records suggest that trauma was in any way connected with the onset of the ocular change later found to be a choroidal sarcoma. Five cases however show features of varying interest.

1. Growth discovered during routine fundus examination of a refraction case, vision 6/6, tension normal, a localized peripheral fundus tumour proved to be a sarcoma on pathological examination.

2. Pigmentary changes at the macula reducing the vision to 6/60 were seen in the case of a patient who, six years later, had her eye excised for detachment of the retina with secondary glaucoma. This eye contained a large sarcoma of the choroid growing from the posterior pole. I have been unable to trace the case since excision.

3. A man of 25 was seen in 1912 with a pigmented area in the sclera just over the ciliary region. He failed to keep under observation, the eye becoming blind some years later. In 1920, he reappeared with secondary glaucoma and the anterior chamber half-filled with a dark growth appearing from beneath the site of the original scleral spot. This proved to be a sarcoma involving ciliary body and iris, but again I have obtained no later history.

4. A woman of 71 had had a tumour of the breast of rapid growth and involving the axilla for nearly 12 months. For one month her eye had been painful and examination showed a tumour (?) far forward in the fundus. She also had an abdominal (?) tumour involving the nerve supply to the left leg. It was supposed that the eye and abdomen contained metastases from a carcinoma of the breast. Section of the excised eye, however, showed it to contain a typical pigmented choroidal sarcoma and there is, therefore, reason to suppose the breast and abdomen also contained melanotic sarcoma deposits though such was never determined.

5. A case from the family whose striking history of choroidal sarcoma I have put together and mentioned in another paper.

As Moorfields Research Scholar I have been able to collect the records put together here and I wish to thank the Staff for permission to use the notes of their cases, and the Curator for the pathological findings.

ANNOTATIONS

The International Congress and Ophthalmic Literature

The suggestion made by the Council of International Ophthalmological Congresses that all ophthalmic journals should publish in each issue the titles of the original articles appearing in all other ophthalmic journals is one that, if carried out efficiently, should be of considerable assistance to all students of ophthalmic literature. A scheme of this nature was attempted some years ago by the *Ophthalmic Review*, now merged with this journal, but fell through on account of the labour involved. This difficulty would be considerably reduced if all journals would agree with a proposal made to this journal by Dr. Morax, the editor of the *Annales d'Oculistique*. He proposes to exchange with each issue a proof of the contents of the two journals. This we have arranged to do, and would be very glad to make a similar exchange with any other ophthalmic journals willing to co-operate.

Colour Vision

On page 633 of this number of the journal we publish the Report of a Committee of the British Association upon Colour Vision—"with particular reference to the classification of Colour-blindness." We venture to express the opinion that no good—and possibly positive harm—is done by dogmatic statements such as are contained in this report, especially when issued under the aegis of a great society of acknowledged scientific prestige. Destructive criticism is little to our taste, unless it takes the form of further scientific investigation and research; but, lest silence should be interpreted as giving consent, reasons must be adduced for an adverse verdict. We shall mention only a few.

Thus, paragraph 1 is probably true, but it has not been proved, and there are cases which have been held by competent observers to indicate the opposite. Is it then a reform to introduce a new nomenclature which may prove as faulty as the old? In the present state of ignorance, if paragraph 2 is accepted—"one must know the actual differences in colour discrimination between normal and hypochromatic individuals"—the quest is vain for it is an as yet unattained counsel of perfection. Paragraphs 4 to 6 conform to the principle that it is well to be off with the old love before one is on with the new, but unless the individual's reasoning capacity is submerged by the waves of emotion he will first decide that the new is better than the old. The old terms

protanopia or red blindness, deuteranopia or green blindness, etc., are admittedly founded upon a hypothesis which may or may not be true, but their correlatives scoterythrous and photerythrous were invented by Rivers for the express purpose of removing this objection. Rivers, indeed, introduced them when he himself was an adherent of the Hering theory; so he at any rate thought that they described two relatively well defined groups of cases, independently of any theory. However, if one is going to be off with the old it is just as well to do it thoroughly. But, *mirabile dictu*, red blindness pops up again in the new classification (paragraph 7). Will not this make confusion worse confounded? Because now it has got a brand new meaning: it "indicates decreased sensitivity to long wave-lengths."

Note to 7 (*a*) tells us that "the best method of showing the defect is to present a curve showing the increase in threshold to light of the region involved." What does this mean? Does it refer to the general threshold or to the chromatic threshold? Surely this ought to be defined, since (paragraph 3) "defects in colour discrimination are not always accompanied by decrease in sensitivity to light"! Further [Note to 7 (*b*)], "Both normal and hypochromatic individuals use differences in brightness as an aid to colour discrimination, therefore some method should be used in which comparisons are made of lights of *unequal* brightness." Is not this a non-sequitur? Surely the lights for the tests ought all to be of the *same* brightness—as in the Board of Trade Lantern recommended by the Sight Tests Committee.

ABSTRACTS

I.—GLAUCOMA

(1) **Hamburger, C. (Berlin).—The treatment of glaucoma with glaucosan, glaucosan-drops, and amine-glaucosan drops.** *Arch. of Ophthal.*, December, 1926.

(1) **Hamburger**, following the suggestion of Ehrlich that the usual theory of the nutrition of the eye could not be correct, attacked the problem afresh in 1897. The results of his work are set out in "Uber die Ernährung des Auges," which he published in 1914. Believing that glaucoma must be due to a relaxation of the vaso-constrictor mechanism, causing dilatation of the blood-vessels and repletion of the eye with blood, which effect is most pronounced in the choroid, he proposed the use of synthetic supra-

renin in glaucoma by which softening of the eyeball with dilatation of the pupil might be produced. He draws attention to the association of a vascular naevus of the face, near the eye, with glaucoma of the corresponding eye, and quotes two cases of acute glaucoma associated with great mental stress, as showing that nervous influence may affect the blood-vessels of the eye and precipitate an attack of glaucoma.

Historical.—At first adrenaline was used by subconjunctival injection for its action on the sympathetic. It was found that by this means good results were obtained in glaucoma simplex, but not in acute glaucoma. The method was also used to dilate the pupil in simple glaucoma and to postpone or sometimes to avoid operation. It was found that where miotics had lost their effect this was restored after the use of adrenaline. With this treatment, however, there is a great rise of blood pressure associated with very rapid pulse and collapse in some cases. Accordingly, a mixture of dextro-rotatory adrenaline and its precursor in the synthesis (1 in 500 and 1 in 100 respectively) was used for subconjunctival injection. Dextro-rotatory is much less active as regards general reaction than the laevo-rotatory form. This mixture is known as "Glaucosan." The desirability of using drops led later to a return to the more active form in a concentration of 1 in 1,000, for the toxic action is not manifest if it is used in this way. "Glaucosan drops" thus contain a mixture of suprarenin and its predecessor in the synthesis (Lab. No. 23). As the drops decompose on exposure to air and in solution they are put up in sealed phials so arranged that the solid and liquid parts can be mixed at will, and then used at once.

Technique.—(*a*) Patient should be lying down or have head bent well back; (*b*) two drops are put in the inner angle of the closed lids; (*c*) separate the lids and instruct the patient to move the eyes about freely for thirty seconds; (*d*) repeat three or four times in an hour.

Effects.—The eye becomes marble white, and there is a pallor of the lower lid extending towards the mouth; the palpebral fissure is widened. These effects pass off in a few hours but the dilatation of the pupil, which is strong enough to break down recent adhesions, and the softening of the eye persist for several days. When the effect passes off the drops may be repeated or the usual miotics may be resorted to as it will usually be found that they have recovered their effect if their action had previously failed. The use of glaucosan drops should be controlled by the tonometer. No harm has been done to the cornea by the use of drops of the usual strength (1/1,000); a faint glistening haze may be seen with the loupe but this quickly passes off. Glaucosan drops, of course, must never be injected.

Indications.—Glaucosan drops should never be used in glaucoma except where the usual miotics have been tried and have failed or produced catarrh; in any event they should be used in rotation with miotics if possible. They should be given a trial in all cases of simple glaucoma before operation is decided upon, and may be used with advantage in iritis with increase of tension as they soften the eye while dilating the pupil. It is interesting to note that the accommodation is only reduced by about two dioptres so that younger patients may read J.1. with dilated pupils. Even in old people the increased amount of light entering the eye, as compared with that when miotics are used, is very acceptable.

Mode of Action.—Hamburger believes that the remedy acts by producing a powerful vaso-constriction in the uvea which forces the venous blood out of that organ and is followed by a prolonged period of arterial hyperaemia, which is very intense. He refers to it as an "inflammatory" hyperaemia, presumably meaning thereby an arterial hyperaemia with serous exudation. He draws a comparison between this and the inflammatory process of cyclitis, with its usual accompaniment of reduced tension, and makes this the basic reason for his treatment with glaucosan drops. "The tension will be reduced as soon as we succeed in changing the venous hyperaemia into an arterial one."

Amine Glaucosan.—In acute glaucoma glaucosan drops are very uncertain in their action. An alternative to immediate operation is now available however in the use of "amine glaucosan," so called by Hamburger. This is a 10 per cent. solution of B. imidazolyl-ethylamine in secale cornutum. "One single drop will narrow a pupil maximally dilated by atropine, scopolamine, or even glaucosan." The pupil becomes quite narrow, the face flushed, and there is much chemosis. The miosis remains for hours after the other effects have cleared up. It is claimed that this miotic is superior to all others in efficacy, but must be used with some caution owing to the fierceness of its action and the tendency to a fall in blood pressure. No harm has resulted from the use of 10 per cent. solutions as drops using the following technique: (*a*) the patient must lie down; (*b*) twice instil holocaine to anaesthetize the cornea; (*c*) warn the patient that there will be aching, smarting, and swelling of the lids for half an hour; (*d*) apply the drop—*one drop only*—as for glaucosan drops; (*e*) if, owing to lacrymation, the drop is washed out at once it may be repeated once only in 30 minutes. If the drug is not applied as above its action will not be complete and the atropized pupil will not contract.

Hamburger says that his observations are incomplete, but suggests that in cases of acute glaucoma, where everything depends on contracting a rigid dilated pupil, treatment by this

drug has great possibilities. Its effect is too transitory for it to be of much use in chronic glaucoma and, of course, it can have no value in the treatment of absolute glaucoma or glaucoma due to tumour or venous thrombosis in old people.

These drugs may be obtained from the Chemische Fabric Wolm, Spangenberg, near Cassel (Germany).

F. RIDLEY.

(2) **Darier, A. (Paris).—An enquiry into the medical treatment of glaucoma. (Enquête sur le traitement médical du glaucome.)** *La Clin. Ophtal.*, March-April, 1927.

(2) In the March number of *La Clin. Ophtal.* **Darier** has started a new hare which will probably have a considerable run, since the experiences of readers are invited. Of late years a number of communications has appeared on the treatment of glaucoma by adrenaline and it is the modern form of this treatment that is now under inquiry. Hamburger especially (*Arch. of Ophthal.*, Vol LV, No. 6) has been studying the effect of certain derivatives of adrenaline and a translation is given of his article, which deals not only with these derivatives but with the experience of ophthalmic surgeons in the treatment of glaucoma by adrenaline. In the April number of *La Clin. Ophtal.* the subject is followed up, in an article by Darier and Godard, in which personal experience of adrenaline leads up to a historical review which ends with the aforesaid researches of Hamburger. It is decidedly difficult to see the wood for the trees because, following all this is a series of ordinary abstracts on the subject of glaucoma from tonometry to treatment which seem to have but little to do with the subject of adrenaline, and one can hardly think that a general symposium on glaucoma is invited. *Revenons á nos moutons.* According to Hamburger there are three derivatives of adrenaline, two of which dilate the pupil and one which contracts it, but all of which lower the ocular tension. These are named:

(1) *Injectable glaucosan* which is dextro-rotatory and is a compound of adrenaline (dextro-rotatory) and methylaminoaceto-pyrocatechin. It dilates the pupil.

(2) *Glaucosan drops*, laevo-rotatory, is a compound of adrenaline (laevo-rotatory) with the above-mentioned polysyllabic substance. It dilates the pupil.

(3) *Amino-glaucosan* is, according to Hamburger, the most powerful of the miotics. It is a white powder very soluble in water and is composed of chlorhydrate of B-Imidoazolylethylamine.

The action of the two first named in dilating the pupil and at the same time lowering the tension is distinctly important, as is at once obvious, but investigations and clinical observations

do not yet seem to be such as to warrant an attempt to give here all the uses, methods of use, and precautions to be taken. Readers who wish to test these drugs should make themselves acquainted with Hamburger's paper either in the original or in the translation (French) above referred to in *La Clin. Ophtal.* for March, 1927. The subject of the treatment of glaucoma by adrenaline derivatives has here merely been introduced to readers: more is likely to be heard of it.

ERNEST THOMSON.

(3) **Darier, A. (Paris).—A case of severe glaucoma ameliorated by glaucosan. (Observation de glaucome grave amelioré par le glaucosan. Mode d'action.)**

Hamburger, Carl (Berlin).—A letter to the Editor of *La Clin. Ophtal.*

Abadie, Charles (Paris).—The medical treatment of glaucoma. (Traitement médical du glaucome.)

Bailliart, P. (Paris).—The rôle of the sympathetic and of adrenaline in ocular pathology. (Rôle du sympathique et de l'adrénaline en pathologie oculaire.) Extract from a report to the Soc. franç. d'Ophtal. *La Clin. Ophtal.*, May, 1927.

(3) In this number of *La Clin. Ophtal.* the above-named articles continue the discussion which was originally headed "Enquête sur le traitement médical du glaucome," but which in this, the May number, has been altered to "Enquête sur les traitements des glaucomes." The two titles do not necessarily cover quite the same ground.

Darier relates the details of a bad case of chronic glaucoma (a woman, aged 74 years, who had had various treatments for many years, including a technically perfect but ineffective iridectomy), in which he employed glaucosan (laevo-rotatory) after the method of Hamburger, namely, five instillations of one drop every 20 minutes. He shows in a table the Schiötz tension and the size of the pupil each 20 minutes. The tension records are 45 (at the commencement), 22, 20, 25, 25. The visual acuity of the right eye (the left being almost blind) was at the commencement of the séances (each séance comprising five instillations as above) equal to 1/10 and, at the end of 5 séances 1/3.

Hamburger writes to correct some errors which had occurred in the French translation of his article which appeared in the March number of *La Clin. Ophtal.* He courteously explains that the errors are not to be wondered at since he wrote originally in German. A translation was made into English for the *Archives of Ophthalmology*, and then another from the English version

into French. All of which shows that wherever possible, when new treatments are in question, the surgeon should avoid translations and, be it said, abstracts. It is better to read the account in the original and better still to see the treatment carried out by the original exponent thereof.

Abadie refers to his theory introduced in 1897 at the Société française d'Ophtalmologie according to which glaucoma is a functional trouble of the ocular sympathetic, characterized by the dilatation of ocular blood-vessels. He quaintly remarks that in spite of his having supported the theory by arguments and solid proofs it has not been accepted. Acting upon his own theory he treats glaucoma (not the acute type) by the systematic and continuous use of (for an adult) one and a half milligrammes of adrenaline per day, equivalent to ten drops of one in one thousand adrenaline three times daily. With the adrenaline Abadie associates ergotine 20 centigrammes per day in two pills, and calcium chloride. Although it is not stated in the text it seems certain that the adrenaline is given by the mouth as is the case with the ergotine and calcium chloride. This internal medication is "reinforced" by the instillation three or four times daily of the following eye drops namely:

Chlorhydrate de pilocarpine	Ogr. 20 cent.
Solution d'adrénaline au millième ...	X gouttes.
Eau stérilisée	10 grammes.

(The above is reproduced exactly as in the original. It presents at least one obscurity.)

"This treatment gives quite remarkable results."

Bailliart refers to the physiology of the sympathetic, a difficult subject, and says that at least we know something about the action of the sympathetic in the eye as revealed by the action of drugs. He speaks of the work of Hamburger on glaucosan (dextro-rotatory) which acts as a powerful local vaso-constrictor and is used in the form of subconjunctival injections, on glaucosan (laevo-rotatory, or in German "links glaucosan"), which is very powerful and can only be safely applied as drops, and on amino-glaucosan "the most powerful miotic," which is a solution of histamine. Bailliart's article is very difficult to follow on account of the numerous trails he pursues, but the reviewer gathers that while conceding that adrenaline and some of its derivatives may be useful in spite of dilatation of the pupil he pins his faith to those substances which do not dilate the pupil, namely pilocarpine and Hamburger's amino-glaucosan.

ERNEST THOMSON.

(4) **Puscariu, Ellena; and Cerkez, V. (Jassy, Roumania).—Hypertony, hypotony. Subconjunctival injection of pilocarpine. Experimental and clinical observations. (Hypertonies. Hypotonies. Injections sous-conjonctivales de pilocarpine. Faits expérimentaux et cliniques.)** *Ann. d'Ocul.*, Vol. CLXIII, p. 484, 1926.

(4) **Puscariu** and **Cerkez** carried out many experiments on rabbits to test the effect upon ocular tension of slight contusion, of heat application by the thermo-cautery and of subconjunctival injections of pilocarpine (0.015 gram.). The results of their experiments led to the conclusions summarized below. They incorporate in their paper reports of eight cases of injury to the human eyeball which showed somewhat similar results. In discussing some observations of other writers they report two cases of interest in addition to some cases of contusion: (1) a case of orbital cellulitis in a man, aged 21 years, due to frontal sinus suppuration, in whom glaucoma was present until after the pus was released from the sinus; (2) a child, aged 11 years, who had received a stab wound in the temporal region five days before and in whom there was increase of tension (45 mm. R.; 20 mm. L.) and impaired vision (R.V. 0.3; L.V. 1.0). The diagnosis of orbital haematoma was made. Seven days later tension was normal and vision recovered.

Of the eight cases of injury to the human eyeball, in two cases within four hours of a slight contusion the tension was raised (35 mm. and 40 mm.); in another, with injury four hours before, there was slight hypotony. Of three cases injured twenty hours before, two had hypotony; the third had slight hypertony, but developed a lower tension than its fellow for a few days. In a case of severe contusion with well-marked external signs, there was high tension for three days (max. 63 mm.). There was no hypotony. No intra-ocular lesion was found in any of the eight cases.

The following facts were proved by experiments on rabbits:

(1) A slight contusion rapidly gives rise to hypertony of short duration followed by hypotony of longer duration. The pupil and iris do not show any change.

(2) Slight thermal excitations (by galvano-cautery) acting on the sclerotic produce immediate hypertony of short duration, accompanied by mydriasis and congestion of the iris; these last two signs are of longer duration than the hypertony, which is followed by hypotony lasting as much as nine hours.

(3) Slight thermal excitations of the conjunctiva or of the cornea have no action on the tension, the pupil or the iris.

(4) Deep conjunctival cauterization produces the same effect as slight scleral cauterization.

(5) Deep scleral cauterization produces hypertony at first, and serous opacities of the cornea, and iris congestion.

(6) Subconjunctival injections of pilocarpine immediately arrest any hypertension that is in the course of developing; they completely suppress it if the injection has preceded the excitation which produces the hypertony.

Clinical Facts

(1) In man, slight accidental contusions always produce temporary disturbance of the tension, frequently hypertony followed by hypotony.

(2) In absolute glaucoma, slight scleral cauterization produces a lowering of the tension for some days, preceded by a temporary rise of tension.

(3) Subconjunctival injections of pilocarpine have no effect in secondary glaucoma.

HUMPHREY NEAME.

(5) **Jaensch, P. A. (Breslau).—Anatomical and clinical researches on the pathology and treatment of congenital hydrophthalmus. (Anatomische u. klinische Untersuchungen zur Pathologie und Therapie des Hydrophthalmus congenitus.)** *Arch. f. Ophthal.*, Vol. CXVIII, 1927.

(5) **Jaensch** gives here an interesting survey of this disease both in its anatomical and clinical aspects. He gives details of the microscopical examination of nine cases, and adds a very full bibliography of the subject.

The changes which he found at the angle of the anterior chamber agree closely with those described by other writers, *viz.*, a wide-open, usually rounded angle: the embryonic structure of the corneo-scleral trabeculae, and incomplete differentiation of the uveal portion of the lig. pectinatum; narrowness, obliteration, or absence of Schlemm's canal; defective development of the scleral spur.

In the iris the conditions vary—in young eyes it was well developed, but in the older buphthalmic eyes its tissue was rendered more dense by the proliferation of pigment and hyperplasia of the connective tissue.

Various factors may operate singly or in combination in the development of hydrophthalmus by retention of the aqueous fluid. These are found in the condition of Schlemm's canal above mentioned, the sclerosis of the trabeculae, the changes at the root

of the iris (stretching or thickening of the tissue, or in the more advanced stages atrophy and connective tissue degeneration) associated with those in the iris itself (proliferation of pigment and the filling up of the crypts with pigment).

In late stages there is a tendency to the formation of a hyaline substance which is not confined to the anterior portion of the eye, but shows itself in the formation of colloid bodies in the choroid. The development of a hyaline layer over the angle of the anterior chamber and surface of the iris leads to shrinking and kinking of the angle.

In the clinical section of this article the most important part relates to the author's conclusions as to the results of treatment. These are : (*a*) purely medical treatment is useless; (*b*) of the various operations that were tried—iridectomy, cyclodialysis, sclerotomy, and trephining—the first and the last gave the best results; but in the case of trephining there is the risk of late infection. Even with operative methods, however, he had 59 per cent. failures (which would probably have been more if the cases had been longer under observation), and this leads the author to conclude with the remark that hydrophthalmus is a condition most difficult to treat effectively, while its prognosis must be regarded as very unfavourable.

THOS. SNOWBALL.

(6) **Schmelzer, Hans (Heidelberg).—On the actual reaction of the blood in glaucomatous patients. (Über die aktuelle Blutreaction bei Glaukomkranken.)** *Arch. f. Ophthal.*, Vol. CXVIII, 1927.

(6) In order to test a new theory of glaucoma (that through the alkalinity of the intra-ocular fluid, supposed to be derived from the blood, there ensued a similar reaction of the vitreous and lens with consequent swelling, that led to an increase in the intra-ocular pressure), **Schmelzer** examined the reaction of the blood in a series of some forty glaucoma patients, together with an equal number of control tests in non-glaucomatous persons, carried out at the same time under exactly similar conditions. These control tests he holds to be absolutely essential and remarks that they were not sufficiently utilized by the author of the theory. He tested the reaction of the blood by the colorimetric method of Cullen as well as the total CO content in the blood plasma, and his results showed that there was no increase in the alkalinity of the blood, or alteration in the CO_2 content, in glaucomatous patients as compared with the normal, and on the strength of these findings holds that this theory of glaucoma is untenable.

THOS. SNOWBALL.

(7) **Schmelzer, Hans (Heidelberg).—Experimental production of alkalinity of the blood and intra-ocular pressure. (Experimentelle Blutalkalosis und Augendruck.)** *Arch. f. Ophthal.*, Vol. CXVIII, 1927.

(7) In continuation of his work on the reaction of the blood in relation to glaucoma **Schmelzer** produced an alkaline reaction of the blood in patients in order to determine whether it would give rise to an increase in the intra-ocular pressure. This was done: (*a*) by the method of forced respiration; and (*b*) by the administration by the mouth of large doses of bicarbonate of soda.

In employing the former method he tested in four patients the reaction of the blood and total CO_2 content before the experiment and again after the onset of symptoms of tetany, and at the same time noted the tension of the eye and the size of the pupil. In ten other cases he only tested the tension with the tonometer.

In no case did he find any indication of an increased tension.

Similar results were obtained by the second method as regards the tension, which, indeed, at first was appreciably lowered: the total CO_2 content was considerably raised, and the pupils slightly contracted. The blood pressure was not altered, and therefore was not responsible for the fall in the tension. These results confirm those obtained from his observations on glaucomatous patients.

THOS. SNOWBALL.

II.—DISEASE OF RETINA

(1) **Davenport, R. C.—Senile macular exudative retinitis.** *Trans. Ophthal. Soc. U.K.*, 1926.

(1) **Davenport** describes a group of cases under this name. The condition is a bilateral change in the macular region in the eyes of senile patients, nearly all his cases being over 70 years of age. The change in one eye at least shows a massive formation, presumably exudative, lying in the outer retinal layers or subretinally. It is usually white or yellowish-white in colour, rounded with sharply-defined edges, and varies in diameter from two to three disc breadths, or even more. It is raised from the general fundus level, carrying the retina forward to a varying degree, and is sometimes irregular in outline or pear-shaped, with the thin end tailing out towards the periphery. There is often brownish pigment near the centre of the mass, and not infrequently exudate is arranged in a circinate manner around it, this varying from something very similar to the true retinitis circinata to little areas of dusty gleaming exudate, more suggestive of cholesterol crystals.

The other macula always shows some lesion; it may be slight at first, but progresses, sometimes to a typical mass like the first, though this is rare. Usually it is very blurred in detail, appearing oedematous, with either small whitish-yellow areas or wispy-looking exudate. In both fundi haemorrhages are constantly found. Beyond some vascular change no intra-ocular lesion has been found having any bearing on the condition. No eye in this series has been obtained for microscopy, but a case was reported by Beatson Hird (*Trans. Ophthal. Soc. U.K.*, XXXVI, p. 345) in which an eye was removed for tumour formation at the macula. It answers in every respect to the conditions of the lesion under review, and the mass was found to be between the retina and its pigment layer, consisting of a fibrous coagulum undergoing organization and having spaces which suggested that they had contained cholesterin crystals. This corresponds with the appearances in Coats's disease, but the clinical picture differs in many aspects.

The aetiology is obscure. All the patients were singularly healthy for their age, and there is not usually gross diffused vascular disease or arterio-sclerosis. It seems essential that the exudative condition is based on a large haemorrhagic exudate deep in the retina as in Coats's cases. In some of the cases it is possible to trace the commencement of the mass on the site of a large deep haemorrhage previously seen, and haemorrhages of the fundus or occasionally into the vitreous are a constant feature. The retinal vessels, with the exception often of the upper or lower temporal artery, are nearly always sound. But with a large mass it is usual to see one of the temporal arteries much altered, being "craggy" in outline, with gross changes in calibre throughout its length. Before the solid mass is established, the finer branches of the retinal vessels approaching the macula are often seen in focus in front of the general fundus, suggesting a transparent exudate, while behind them can be dimly seen the commencing white mass of organized matter. It seems possible that there is either a large, deep retinal haemorrhage, or else a serous exudate which organizes into the white, solid tumour so typical of the condition. The cholesterol crystals or circinate exudate may be the results of alteration in the other blood constituents, as in the case of haemorrhage. It is possible that in all these cases there exists a raised blood pressure which in most has fallen to a more normal level, accompanied by very limited and local arterial disease, which might be expected to cause changes in such a structure as the macular region. This is put forward by the author as a pure hypothesis. Treatment is of little avail. As regards prognosis, the only local symptom is the impaired central vision, and prognosis is good as far as peripheral vision is concerned.

Little change takes place in the mass, once formed. Three cases have died while under observation, all of them over 80, and in no case was death due to cerebral haemorrhage or uraemia, which would point to the lesions in arteries and kidneys not being of serious import.

G. G. PENMAN.

(2) **Redslob, E. (Strasbourg).—Experimental investigation of spasm of the retinal arteries. (Recherches expérimentales sur les spasmes des artères rétiniennes.)** *Ann. d'Ocul.*, Vol. CLXIII, p. 169, 1926.

(2) **Redslob** refers to the observations of various authors as to the possibility that central artery spasm may cause optic atrophy, that in certain cases embolism of the artery is a cause of atrophy, but that in others thrombosis of the artery follows spasm, and that the clinical picture is identical. He produced central artery spasm in rabbits by the injection of a small dose of adrenaline into the vitreous. The spasm produced a marked narrowing of the retinal vessels in the eye treated, pallor of the optic disc, and in a few cases retinal oedema—described in one case as being like cotton wool around the area of medullated nerve fibres. This spasm persisted for several weeks or months with, in most of the cases, loss of vision as tested by the response of the pupil and eyelid on exposure to light. (In the rabbit the pupil reaction is slight but the winking reflex is very brisk on exposure to light. The pupil reaction was studied with the help of the corneal microscope and its special method of illumination.) The spasm was apparently unaffected by the injection of various antispasmodics or vasodilators (atropine, sodium nitrite, pilocarpine, dionine). Histological examination of two normal (left) eyeballs and four of those injected with adrenaline failed to reveal anything more than marked narrowing of the retinal arteries of the latter. There was no degeneration of retina or of optic nerve, and no change in the walls of the vessels and no thrombosis.

The importance claimed for this investigation is that in certain cases the clinical appearances usually accepted as denoting the presence of atrophy of the optic nerve do not necessarily denote that such degeneration is present. This may hold even where such clinical appearance persists for weeks or months. In all cases of narrowing of the retinal arteries which may be due simply to spasm, attempts should be made by antispasmodic treatment to relieve the condition. In the rabbits it is possible that the spasm was not sufficient completely to close the lumen. The application of larger doses of adrenaline might possibly have such an effect with consequent degeneration of the endothelium and thrombosis. Ophthalmoscopic examination does not allow of differentiation

between arterial spasm without obturation and without pathological change on the one hand, and spasm with thrombosis and optic atrophy on the other. In man it is stated that in spasm without atrophy the pupil reaction persists even in the presence of almost complete loss of vision. A curious phenomenon of biological significance was observed in three albino rabbits and not in the others which were not albinos. A posterior cortical opacity of striate form developed in the lens in each case.

HUMPHREY NEAME.

(3) **Collin (Hué).—Retinal haemorrhages following a head injury. (Hémorragies rétiniennes à la suite de contusion crânienne.)** *Ann. d'Ocul.*, Vol. CLXII, p. 854, 1925.

(3) **Collin** reports the case of a man, aged 25 years, who was injured by an elephant. There was an area 12 centimetres in length in the right occipital region in which the scalp was torn up. In addition there were contusions of neck and chest, concussion and loss of consciousness. On recovery, he lost 150 c.c of blood by the mouth; this blood was red and frothy and probably emanated from an injury to the lung. The right eye showed some haemorrhages, chiefly along the right inferior temporal retinal vessels, but there was also a subhyaloid haemorrhage. There were positive absolute scotomata corresponding with the haemorrhages. The possible causes of the haemorrhages were: (1) forcible contact of the eyeball against the posterior bony wall of the orbit. This was most improbable. There was no sign of direct injury to the eyeball. (2) Possibly by an effect of *contre-coup* from the blow on the posterior part of the skull. (3) By compression of the thorax as in the case of intra-ocular haemorrhages in the new born. The patient on regaining consciousness complained of very severe pains in the left side of the chest. There were some rents in his clothing and damage to the skin behind the right shoulder, indicating probable trampling by the feet of the elephant. Visual prognosis was bad in this case owing to involvement of the macula with haemorrhages. In one month's time, the vision was 1/10, the tension in both eyes was low and remained low for one month, the right being lower than the left.

HUMPHREY NEAME.

(4) **Halbertsma, K. T. A. (Delft, Holland).—A case of spasm of the central artery of the retina. (Un cas de spasme de l'artère centrale de la rétine.)** *Ann. d'Ocul.*, Vol. CLXIII, p. 641, 1926.

(4) **Halbertsma** precedes the description of this case with a review of the literature dealing with spasm of the central artery of the retina. He refers to three interesting cases reported by

other writers. Extraction of the root of a tooth around which had been formed a granuloma in one case and a cyst in another was followed by the disappearance of central artery spasm (quoting Bruner and Polliot). A case of Redslob's of arterial spasm with reduction of vision to 1/10, recovered vision of 4/10 after incision and curettage of the ethmoidal sinus of the same side. A recurrence of spasm occurred some months later with vision reduced to perception of light which persisted. In a few days the opposite eye suffered in a similar manner, but the vision was soon restored after suitable treatment combined with an anti-spasmodic. It is suggested that some cases of central scotoma may be due not to retrobulbar neuritis but to a reflex spasm of the central artery, the result of a septic focus in the teeth or nasal region. Abadie is quoted as having used with success in central artery spasm an immediate retrobulbar injection of 1 c.c. of 1/1,000 atropine solution followed by further injections and internal administration of small doses of atropine.

Halbertsma describes in detail the case of a girl, aged 17 years, who had noticed for several months the occasional appearance as of something black in front of the left eye. One morning the left vision was found to be and to remain definitely worse than that of the right eye. The general health was excellent. The patient appeared in very good health. A noticeable feature was blushing. The right vision with correction was 10/10, the left 2/10. The left pupil reaction was less than the right. The right fundus was normal; the left showed an appearance the description of which implies oedema of the retina around the macular area with the presence of a cherry red centre depressed below the rest. The vessels were greatly narrowed and lost to view in places in the oedematous area. With Bjerrum's screen the right blind spot was found to be normal. The left central field was reduced to a small area to the temporal side of the fixation point for white and coloured objects. Against a diagnosis of embolism, thrombosis or endarteritis obliterans were the following facts: nowhere was a vessel obliterated; the macular arteries were normal except for very narrowed lumen; contrary to the usual occurrence in embolism, the onset was gradual; the final visual acuity of 2/10 was against an embolism in which return of vision was impossible. For several weeks there was but slight alteration in visual acuity or in the field after an early return of the central field. The vision became 2.5/10. During the course of internal administration of atropine (1 mgr. per diem) the vision gradually improved to 4/10 in two to three months. No dental sepsis was found; the radiography of the nasal region showed normal conditions; the blood and urine were healthy and the Wassermann reaction negative. The optic disc became bluish-white in colour, with well-defined

margin. The patient's nervous disposition and the absence of any circulatory condition to account for embolism supported the diagnosis of central artery spasm. The following methods of treatment have been advocated in addition to that mentioned above: amyl nitrite inhalation, reduction of ocular tension by miotics, by paracentesis or by iridectomy. The condition of arterial spasm is found in nervous young subjects, especially in females with an abnormal vasomotor activity (*prédisposition vaso-motrice*) and in whom frequently a sick-headache (*migraine*) is accompanied by a disturbance of the vision. It is considered probable that two factors enter into the production of arterial spasm, hyperexcitability and excessive stimulation.

HUMPHREY NEAME.

(5) **Haïri H. (Constantinople).—Spasm of the central artery of the retina and subsequent obstruction of the inferior temporal artery. (Le spasme de l'artère centrale de la rétine et l'obstruction consécutive de l'artère temporale inférieure.)** *Ann. d'Ocul.*, Vol. CLXIII, p. 662, 1926.

(5) Haïri quotes Siegrist as expressing the opinion that transient blindness does not necessarily indicate spasm of the central artery of the retina. It may be due to a temporary defect of the heart's action in a patient with retinal arterio-sclerosis, or to a very minute embolus. The diagnosis depends essentially on the results which follow the use of antispasmodics and vasodilator medicaments. In a case in which the spasm is of such duration or so intense as to be followed by a permanent defect, the diagnosis is of no consequence—the condition is clinically the same as in embolism. Haïri refers to experimental work by Redslob in which the suggestion is made that an arterial spasm may possibly be so intense as to lead to complete emptying of the vessel with damage to the endothelium and subsequent permanent obstruction. Haïri reports the case of a patient examined when he was assistant to Gourfein at Geneva. The patient, a healthy woman, aged 23 years, complained of attacks of transitory blindness in the right eye. From the age of fifteen years the attacks had occurred irregularly with intervals of one to four weeks, with a positive scotoma in various positions. Onset was sudden, duration three or four minutes, termination gradual. One attack was accompanied by very severe pain in the right temple which lasted four minutes, and was followed by a persistent scotoma in the superior nasal field which remained ever since (three years). The visual field loss corresponded with the inferior temporal artery. The artery was visible ophthalmoscopically as a whitish streak.

HUMPHREY NEAME.

(6) **Heine, L. (Kiel).—Various anatomical conditions in three cases of Coats's disease. (Verschiedene anatomische Befunde in drei Fällen von Coats-Retinitis.)** *Zeitschr. f. Augenheilk.*, Bd. LX, S. 1, 1926.

(6) **Heine** describes the pathological findings in three cases of Coats's retinitis. The first was a case of detached retina with the typical picture of Coats's retinitis, in which the eye was removed later for an irido-cyclitis with low tension. The original condition developed with the accompaniment of extremely severe temporal headaches and fits. It was interpreted as a detachment of the retina and ciliary body owing to post-inflammatory shrinkage consequent on a metastatic ophthalmitis accompanying a mild meningitis. The second case had the eye excised since the appearances resembled a Coats's retinitis or a tumour. Examination showed a circumscribed exudative choroiditis. The third showed a bilateral Coats's retinitis, in which pathological examination of one eye showed that a degenerated shrinking vitreous had caused an extensive retinal detachment, while the retina itself showed extensive cyst formation.

From his own observations and a survey of the literature Heine concludes that the disease which appears clinically and ophthalmoscopically as Coats's exudative retinitis may be caused anatomically and pathologically in the following ways: glioma; pseudoglioma; metastatic ophthalmia; choroiditis circumscripta; chorio-retinitis; haemorrhagic retinitis; primary shrinkage of the vitreous with detachment of the retina and the formation of perforations and cysts.

W. S. DUKE-ELDER.

(7) **Lachman, George S., M.D. (Baltimore).—Bilateral haemorrhagic detachment of the retina in the newborn, simulating glioma.** *Amer. Jl. of Ophthal.*, March, 1927.

(7) **Lachman** opens his paper with a short review of the literature of this condition, the references to which are given at the end of this abstract. The history of the present case was that delivery was effected by forceps without any difficulty, and that a few months after birth the parents noted the child's eyes were abnormal. He was seen at three and a half months, when both eyeballs were found to be enlarged and under increased tension. The pupils were widely dilated, and through them a brownish mass could be seen behind the lens, flecked with haemorrhages, but not showing any definite vascularization. Three ophthalmologists independently diagnosed glioma of the retina, so both eyes were excised. Pathological examination revealed the presence of complete (umbrella) detachment of the retinae, the subretinal spaces being occupied by blood-stained serum. There were a few

peripheral anterior synechiae, and the iris showed an extreme degree of shrinkage. The subcapsular epithelium of the lens, instead of stopping at the equator, extended almost to the posterior pole, where there was a small subcapsular cataract. The ciliary body and the choroid showed extensive haemorrhages, the vessels of the latter being markedly engorged. There was a dense membrane passing across the globe behind the lens. The haemorrhagic mass separating the retina from the choroid was evidently fairly old, because it showed disintegration and phagocytosis of the red cells, with commencing organization. The eyes of 73 infants, still born, or dying within a few days after birth, were examined histologically. In five of these retinal haemorrhages, in six choroidal haemorrhages, and in two others both retinal and choroidal haemorrhages were found.

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F. A. WILLIAMSON-NOBLE.

(8) **v. Hippel, E. (Göttingen).—The anatomical appearances in a case of primary syphilitic disease of the retinal vessels. (Anatomischer Befund bei einem Fall von primärer syphilitischer Erkrankung der Retinalgefässe.)** *Arch. f. Ophthal.*, Bd. CXVII, 1926.

(8) **v. Hippel** has put this case on record as being the first one of typical uncomplicated syphilitic disease of the retinal vessels that has so far, to his knowledge, been submitted to anatomical examination.

The patient was a man, aged 53 years, in whom examination of the fundi showed the retinal arteries converted into thin white lines: the blood column in the veins broken in many places, and here and there constrictions of the veins; a few small haemorrhages; slight excavation of the papilla with some pallor.

With the aid of the clinical picture that had been made it was possible to distinguish between the main arteries and veins in the lower part of the fundus, but it was difficult to describe exactly the condition of the vessels and interpret them owing to the lack of differentiation of the individual coats; it was impossible to make out anywhere satisfactorily the muscular coat of the arteries.

The one certain feature, however, was the thickening of the vessel wall affecting both the intima and the adventitia. In the arteries infiltration with lymphocytes was only slight and occurred mainly in the adventitia. A marked proliferation of nuclei could be observed well beyond the adventitia. There was no proof that proliferation of the endothelium played an important part.

An attempt to show up the coats of the vessels by staining the elastic fibres failed to give a satisfactory result: it was, at any rate, impossible to recognize a real elastica interna, so that one could not say exactly where the increase in the intima began. In the veins no elastic fibres could be observed; in the arteries they had probably been broken up into very fine fibrils.

The changes in the retinal vessels described in this case were, as was to be expected, similar to those found in syphilitic retinitis and chorio-retinitis, and recorded by various authors, most of whom described the adventitia as the chief site of the disease, the intima being secondarily affected.

THOS. SNOWBALL.

(9) **Ochi, Sadami (Sapporo, Japan).—So-called cystic degeneration in the peripheral retina.** *Amer. Jl. of Ophthal.*, March, 1927.

(9) **Ochi's** paper begins with a résumé of the literature on this subject in which Ivanoff is quoted to the effect that he was unable to find a single instance of cystic degeneration of the retina among 20 eyeballs taken from children up to 8 years old, yet he found 26 examples in 48 eyes taken from patients, aged 50-80 years. Greef found one example of the condition in a child, aged 6 years. Ochi examined, histologically, the eyes of 15 children, aged from birth to 4 years and 7 months, and found the condition in three instances. The first was a child, aged 3 years 8 months, who died from auto-intoxication; the second, aged 4 years and 6 months, died from tuberculous meningitis and the third, aged 4 years and 7 months, died from dysentery. In none of the cases was there any indication of eye disease. The author is not therefore inclined to look upon the change as essentially senile. His explanation of its occurrence is that the peripheral part of the retina is closely connected with the vitreous, and, at the same time, is located in a place where it might be influenced by contraction of the ciliary muscle and strain on the zonula. A result of this might be the stagnation

of lymph in the retina with the gradual development of cystic spaces to contain it. In other words, the deposition of the lymph is to be regarded as a primary condition, whereas according to the older view, it was the retinal degeneration which was the primary change, the spaces formed becoming secondarily filled with lymph.

F. A. WILLIAMSON-NOBLE.

III.—MISCELLANEOUS

(1) **Harman, Bishop (London).—Some common eye conditions.** *The Practitioner*, January, 1927.

(1) **Harman** gives a useful account of some of the commoner eye diseases likely to be met with in general practice. Ophthalmic surgeons may be reminded that of the children seen in the schools for the blind, and in the myope classes, no less than 7.3 per cent. owe their defective vision to the ravages of phlyctenular keratitis. At the age of maximum incidence of the disease, which is the fifth year, there is the maximum decay of the milk teeth, and it is likely that the resulting irritation of the fifth nerve may be reflected in a herpetic eruption of the terminals of the ocular twigs of that nerve, such as is seen in the phlyctenules. That this association is a real one is confirmed when the seat of election of the phlyctenule is ascertained; it is found to be in the lower and outer quadrant of the limbus, the part supplied by the same nerve branches which supply the upper teeth. It is therefore important to get the mouth thoroughly cleansed. The value of artificial sunlight in the general treatment of the condition might also have been mentioned.

A. F. MACCALLAN.

(2) **Imre, Joseph (Pecs, Hungary).—Protection of the eyes by reflecting glasses.** *Arch. of Ophthal.*, March, 1927.

(2) **Imre** observes that although there is a considerable literature on protecting glasses, the subject still merits investigation, especially from the point of view of what kind of rays should be kept back from the diseased eye, and what rays can be regarded as exerting a healing factor. For example, we know that short wave light has a good influence on tuberculous processes and that in such cases, smoked glasses are not quite rational because they keep back both the violet and ultra-violet rays. Ultra-violet rays shorter than 300$\mu\mu$ do not pass the cornea and cause only superficial changes, those between 300 and 400$\mu\mu$ are absorbed by the lens, the absorption being greater, the older the patient. Most of the modern protecting glasses have been designed for absorption of the ultra-

violet rays, *e.g.*, Crookes, Hallauer, etc. For absorption of infra-red rays iron oxydul glasses are recommended. The disadvantage of most protecting glasses is that they do not give protection against heat rays, in fact, most of them may be said to generate heat through absorption of the visible rays. It seems more rational therefore to use glasses which shall reflect the harmful rays back, rather than absorb them and convert them into heat. Imre was therefore led to investigate the properties of thin metallic layers. Silver one fifteen millionth of a millimetre thick lets through 32 per cent. of the blue and violet rays between 460 and 480$\mu\mu$, gold of 10$\mu\mu$ thickness lets through the green rays between 500 and 540$\mu\mu$ in 38 per cent. The reflection of ultra-violet rays may be looked upon as perfect if the layer exceeds 15$\mu\mu$ in thickness. Platinum holds back the whole visible spectrum evenly, and its colour is therefore neutral grey. With regard to heat rays, those whose wave length exceeds 1000$\mu\mu$ are checked by platinum in 73 per cent., by gold in 95 per cent., by silver in 97 per cent., almost exclusively by reflection. Thus glasses may be made, covered with thin metal layers so that they protect the eyes equally from ultra-violet and infra-red rays and in any desired degree from the visible rays. Such glasses are very comfortable to wear and give a feeling of coolness in summer sunshine. For pathological cases they are also satisfactory, and patients are found to prefer reflecting glasses to any of the ordinary protecting glasses. They are mounted in a light goggle frame, which protects the eyes from side illumination and reflexes. For very acute iritis, platinum was used, in a thickness that reflects 98 per cent. For tuberculous disease, silver is better, because it reflects the visible rays in any desired percentage, but lets through the rays between 480-430$\mu\mu$ in greater quantity.

F. A. WILLIAMSON-NOBLE.

REPORT OF THE BRITISH ASSOCIATION COMMITTEE ON COLOUR VISION

THE following is the report of the Committee appointed by the British Association "to report upon colour vision, with particular reference to the classification of colour-blindness." The members of the Committee were: Sir Charles Sherrington, *Chairman*; Prof. H. E. Roaf, *Secretary*; Dr. Mary Collins, and Dr. F. W. Edridge-Green:

"1. Defects of colour vision usually consist of a decrease in the perception of colours, therefore hypochromatism or hypochromatopia is a suitable term for defects in colour vision.

2. In order to classify satisfactorily the defects in colour vision, one must know the actual differences in colour discrimination bewteen normal and hypochromatic individuals.

3. Defects in colour discrimination are not always accompanied by decrease in sensitivity to light. Localized decrease in sensitivity to long wave lengths is not infrequent, a similar decrease in sensitivity limited to short wave lengths is also found, but the statement that there are cases with a localized decrease in sensitivity to intermediate wave lengths is not proved.

4. The terms red blindness, violet blindness, etc., are meaningless, except on the basis of a decrease in sensitivity limited to the corresponding portion of the spectrum.

5. Decrease in sensitivity to light such as is mentioned in paragraph 4 will cause change in colour value of all colours which include those wave lengths to which the individual is less sensitive than the normal, but when there is no decreased sensitivity to light the term confusion should be used. Thus red-yellow-green confusion would describe the usual form of hypochromatism in which there is decreased ability for distinguishing colour differences at the longer wave lengths of the spectrum. It would be preferable to indicate the actual wave lengths at which discrimination is defective, as that would indicate the extent of the defect and not merely the qualitative region of the spectrum involved.

6. The nomenclature at present in use is unsatisfactory, and it is recommended that it be discarded. The descriptions of cases are very defective, as one cannot be certain whether they are based on theory or on examination of the cases. By the loss of one system of the Young-Helmholtz hypothesis dichromatic vision would occur, there being only two colours recognizable in the spectrum. Such a loss is implied in the following terms, which should be abolished.

(*a*) Protanopia, or scoterythrous vision, has been used to imply a failure to distinguish between red, yellow, and green, with a shortening of the long wave length end of the spectrum.

(*b*) Deuteranopia, or photerythrous vision, has been used to imply failure to distinguish between red, yellow, and green without any shortening of the spectrum.

(*c*) Tritanopia has been used to indicate a failure to distinguish between blue and green, not necessarily accompanied by shortening of the short wave length end of the spectrum.

7. The following method of classification is recommended, as it avoids all theoretical views and allows for variation in degree of the defect.

(*a*) Any marked decrease in sensitivity to a special region of the spectrum should be specified as blindness; thus red blindness indicates decreased sensitivity to long wave lengths, and if one can state the wave lengths involved the description will be more accurate.

Note to 7 (*a*).—The length of the spectrum for a normal individual will vary with the intensity and quality of the light used, as well as with the characteristics of the optical system. Therefore the best method of showing the defect is to present a curve showing the increase in threshold to light of the region involved. Any spectral apparatus with a shutter for isolating a narrow region of the spectrum can be used to determine the rise in threshold, if the intensity of the light is varied by an episcotister or a photometric wedge. Any shift in the region of maximum intensity would be shown by such a method.

(*b*) Any failure to discriminate colours should be described as confusion, prefixing the colours confused, *e.g.*, yellow-green confusion. The number of distinct colours which are recognized in the spectrum is a rough measure of the degree of colour discrimination; thus Dr. Edridge-Green classifies those with defective colour discrimination as penta- tetra-, tri-, di-, and mono- or a-chromats. As in 7 (*a*), it is preferable to have some quantitative statement of the degree of the defect.

Note to 7 (*b*).—Both normal and hypochromatic individuals use differences in brightness as an aid to colour discrimination, therefore some method should be used in which comparisons are made of lights of unequal brightness. As normal persons have maxima of discrimination, at wave lengths 5850 A° and 4950 A°, and at the same wave lengths differences in intensity do not cause a change in colour, therefore one method of measurement would be to state the maximum mistakes at these regions. A difference of over 50 A° or a range of over 100 A°, if the difference on each side of a fixed wave length is measured, would indicate defective colour discrimination. (See Roaf, *Quart. Jl. Exper. Physiol.*, 1927, Vol. XVI, pp. 379-392.) The measurement would correspond to a monochromatic patch as measured by Dr. Edridge-Green, if the difference in brightness between different wave lengths of the same spectrum could be eliminated.

(*c*) All those persons with dichromic vision—*i.e.*, who recognize only two colours in the spectrum—possess a neutral region, the position and extent of which should be determined."

BOOK NOTICES

Atlas of the Histopathology of the Eye. By Dr. ADALBERT FUCHS. Part II, with 108 illustrations contained in 32 coloured plates. Vienna and Leipzig: Franz Deuticke. 1927. Price, 78 marks.

It was with much pleasure that we greeted the first part of this work by the son of one of our most revered colleagues. We are glad to renew our appreciation of a second instalment of the atlas, and—like Oliver Twist—we ask for more. We are filled with admiration—and envy—of the beautiful coloured lithographs of microscopical sections. All sorts of conditions are illustrated, without any very apparent rhyme or reason—yet all are welcome. They range from various conjunctival, palpebral, orbital, nervous, and operative conditions to retinitis sclopetaria, which we confess we never heard of before. The photographs are accompanied by a descriptive booklet, in which we find—and for the benefit of our readers quote—that retinitis sclopetaria is the consequence of a severe contusion of the eyeball by a projectile passing at a short distance from the eye. After all, it is an old friend, and was described long ago by Nettleship.

Dextrality and Sinistrality of Hand and Eye. By T. W. WOO and KARL PEARSON. From *Biometrika*, Vol. XIX, p. 165, 1927. Cambridge: University Press.

Mr. Woo and Professor Karl Pearson in this monograph attack the question of the association of right handedness with right eyedness, and the corresponding sinistral correlation. They give an exhaustive history of the theory, even to the extent of seriously debating the animadversions of G. M. Gould. The critical discussion of the work of van Biervliet, Sir George Humphrey, P. N. Callan. Le Conte, and Parson ("Left-handedness, a new interpretation," New York, 1924), is full of interesting matter and logical force, The authors, however, have not been content with a merely academic debate. They have examined statistically the records of 7,000 males of Galton's first Anthropometric Laboratory, that of the Health Exhibition of 1884, which state: (1) the visual acuity of right and left eyes, measured by the distance in inches at which diamond type could be read; and (2) the grip in pounds of right and left hands. Perhaps these data are not as precise or suited for the end in view as one could wish, but so far as they go they show, in the words of the authors, that "there is no evidence whatever of even a correlation between ocular and manual lateralities to say nothing of a master eye determining which is the master hand. Our data are wholly opposed to the theory of absolute laterality."

One would not, *à priori*, expect the theory to find much favour, for example, with neurologists or ophthalmologists, though it is sufficiently specious to have led many astray. Presumably the laterally placed eyes, with unilateral fields of lower mammals are strictly lateral organs. Human eyes, however, with their so-called semi-decussation of the visual nerve fibres, are each of them bilateral organs, and partial decussation or not, the same is true in less degree of lower mammalian eyes with overlapping fields. When one contemplates the colossal tables and graphs which accompany this paper one cannot but feel that the nut has been cracked with a steam hammer. Perhaps, however, no other method could have proved that "a dominant ocular dextrality in some as yet unexplained and mysterious manner, enforcing a dominant manual dexterity is unprovable as well as unproven." And it is consoling to know that "lateralism whether ocular or manual is a continuous variate, and that dextrality and sinistrality are not opposed alternatives, but quantities capable of taking values of continuous intensity and passing one into the other."

We cordially endorse the sentiment expressed in the motto which the authors quote from van Bardeleben—"Keine Erklärung ist aber doch besser als eine oder mehrere irrthümliche."

Nasal Neurology: Headaches and Eye Disorders. GREENFIELD SLUDER, M.D., F.A.C.S., Professor of Oto-laryngology, Washington University School of Medicine, St. Louis. Pp. 428. Illustrations 168. London: Henry Kimpton. 1927. Price, 50s.

This book by a well-known American rhinologist presents many features of interest and importance to the ophthalmic surgeon. The grosser ocular lesions which may result from sinus inflammations are well known, but it may not be always sufficiently recognised that minor degrees of sinus disease, unaccompanied by any obvious suppurative process, may also produce symptoms and changes which may bring the patient under the care of the ophthalmologist. Particularly is this the case with certain types of headache, and anything which may increase our powers of differentiating the causes of headache is certain of a welcome.

Naturally, a considerable portion of Dr. Sluder's book appeals only to the rhinologist, especially the descriptions of the technique of various operations, but the aetiology of frontal vacuum headache, the various neuroses that may arise from involvement of the sphenopalatine ganglion, and the different ways in which sphenoidal sinus inflammations and hyperplasias may produce ocular complications, interest oculists and neurologists equally.

It is to be regretted that the pruning knife has not been employed more freely. The book might easily have been reduced to half its size and its value greatly increased by a more direct style, the

avoidance of repetition and the excision of some of the more speculative matter. We believe that, by doing so, Dr. Sluder would secure a fuller appreciation of the great value of much of the work that he has put into this volume.

CORRESPONDENCE

ADRENALINE IN GLAUCOMA AND IRITIS

To the Editor of THE BRITISH JOURNAL OF OPHTHALMOLOGY

DEAR SIR,—German and American literature has had many references to the injection of adrenaline for glaucoma. Thus Hamburger (Berlin), 1924, advised a subconjunctival injection of 0.2—0.4 c.cm. suprarenin (Hochst) after the instillation of 2 per cent. holocaine in the case of failure to lower tension with the usual miotics. Further F. H. Rodkin (San Francisco) recommended subconjunctival injections of atropine and epinephrine in acute irido-cyclitis in cases where instillation of atropine or the use of crystals of atropine fail to dilate the pupil. In asthma the subcutaneous dosage of adrenaline usually employed is 5 to 10 minims, while in cases of shock we used to inject intravenously with saline 10 to 20 minims. Again in cases of heart failure 10 minims have been injected into the heart. Therefore, when I commenced to use adrenaline subconjunctivally, I did not realize the importance of limiting the dose to Hamburger's recommendation of 0.2—0.4 c.cm.

I have employed adrenaline in three patients, one of whom died within five minutes after injection, in one signs of general vaso-constriction were evident, whilst the pulse became so weak that strophanthin was employed. The third showed signs of vaso-constriction.

Case 1.—A patient, 49 years of age. An Elliot trephine operation was performed on both eyes for glaucoma. A haemorrhage occurred in one eye and as it was slow in absorbing, I decided to try the effect of adrenaline. On about the fourth day after operation, I injected subconjunctivally about 0.5 c.c. of adrenaline 1 in 1,000. Immediately the patient complained of a violent pain in the back of her head, became dyspnoeic, blanched, and died within five minutes from the time of injection.

Case 2.—A patient, 44 years of age. A frail woman who had tuberculous iritis, but no signs of general T.B.

The slit-lamp showed large deposits on the posterior surface of the cornea, many synechiae, and pupil filled with a membrane. The patient had been treated with tr. of iodine by mouth, tuberculin (B.E.), subconjunctival injections of hydrarg. cyanide 1/5,000, with

acoine and aspiration of the aqueous with injection of air. To none of these treatments had the patient objected. Owing to the difficulty in treating the synechiae I injected two minims of atropine, 2 per cent. and four minims of adrenaline, 1 in 1,000. Almost immediately, *i.e.*, as I stood by her bed, the patient complained of a pricking sensation in her hands and arms, followed by numbness, a sensation of numbness in the back of her head and palpitations. Her teeth chattered, and a shivering sensation passed over her whole body. The pulse became rapid, feeble and irregular, digitalin gr. 1/50 and morphia gr. 1/4, and later strophanthin, gr. 1/200 were administered. These various sensations lasted about twenty minutes.

Case 3.—A patient, 41 years of age. A robust woman had acute keratitis and irido-cyclitis of the left eye. Being unable to find a focus of infection, I treated the patient with atropine, dionine, adrenaline, milk injections, and subconjunctival injections of hydrarg. cyanide 1/5,000 with acoine 1 per cent. Before the onset of irido-cyclitis, whilst the keratitis alone was being treated, the patient received subconjunctival injections of phenolaine. To none of these injections did the patient object, and so I resorted to a subconjunctival injection of two minims atropine, 2 per cent. and four minims adrenaline, 1 in 1/1,000. The patient's pulse did not become weak, nevertheless, she complained of her legs becoming cold, a lump on her chest, a numbness on the top of her head, and a choking sensation. Thus in cases 2 and 3, I carefully measured the adrenaline, whilst in case 1, I can only say the injection was about 0.5 c.c., *i.e.*, I may have injected more. The injections in cases 2 and 3 did not dilate the pupils. I am so alarmed at the result of these injections that I shall not inject adrenaline subconjunctivally again. But in cases of glaucoma I shall soak cotton wool in adrenaline and place it under the upper lid after applications of holocaine 2 per cent., for I found this efficacious in one case in which the tension fell from 70 to 40 (McLean's tonometer) in a patient on whom I previously had done an iridodialysis, which had resulted at once in tubular vision, which passed on to complete blindness in some months. This mode of applying adrenaline is not only efficacious but was carried on at home daily by the patient's wife. An alternative is to use a tuberculin syringe graduated in fractions of a c.c. and adhere closely to Hamburger's dosage of 0.2—0.4 c.c.

Yours truly,

OPHTHALMIC SURGEON.

REFERENCES

Hamburger.—Abstracted in Ars. Medica, No. 6, p. 270, 1924; No. 7, p. 276, 1925; No. 1, p. 35, 1926. *Brit. Jl. of Ophthal.*, Vol. XI, pp. 239, 614, 1927.

Rodkin, F. H.—Treatment of Irido-cyclitis by Subconjunctival Injections of Atropine and Epinephrine. *Amer. Jl. of Ophthal.*, p. 24, January, 1926.

NOTES

Honour

Mr. ERNEST CLARKE, C.V.O., has been elected an Honorary Fellow of Downing College, Cambridge.

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Appointments

Colonel R. E. BICKERTON, D.S.O., T.D., A.D.M.S. 56th (1st London) Division T.A., has been appointed Hon. Surgeon to H.M. the King.

Dr. PERCIVAL J. HAY has been appointed Lecturer in Ophthalmology to the University of Sheffield.

FUTURE ARRANGEMENTS

1927

December 2.—North of England Ophthalmological Society at Leeds.

December 9.—Royal Society of Medicine, Section of Ophthalmology (Clinical Meeting).

1928

January 13.—Royal Society of Medicine, Section of Ophthalmology.

February 3.—North of England Ophthalmological Society at Newcastle-on-Tyne.

February 8.—Annual Dinner of the Royal London Ophthalmic Hospital at the Langham Hotel.

February 9.—Royal Society of Medicine, Joint Meeting of Sections of Ophthalmology and Neurology.

March 2.—North of England Ophthalmological Society (jointly with the Midland Ophthalmological Society) at Sheffield.

March 9.—Royal Society of Medicine, Section of Ophthalmology (Clinical Meeting).

March 30.—North of England Ophthalmological Society at Liverpool.

April 19-21.—Annual Congress, Ophthalmological Society of the United Kingdom at the Royal Society of Medicine.

May 11.—Royal Society of Medicine, Section of Ophthalmology.

June 8.—Royal Society of Medicine, Section of Ophthalmology (Annual).